Vol. XIX April, 1943 No. 2

E. INST. ENT. LIBRARY 20 JUL 1943 U.S.A. 126

E & A

THE PAN-PACIFIC ENTOMOLOGIST

Published by the
Pacific Coast Entomological Society
in co-operation with
The California Academy of Sciences

CONTENTS

VAN DYKE, NEW SPECIES OF WEST AMERICAN COLEOPTERA 41
MALKIN, ZUPHIUM AMERICANUM DEJ. IN OREGON 52
KNIGHT, FIVE NEW DICYPHUS AND ONE NEW CYRTOPELTIS 53
PRENDERGAST, OBSERVATIONS ON BLISSUS MIXTUS 59
USINGER, TYPES OF ARADIDAE 60
LEECH, BEROSUS EXILIS LECONTE A HEMIOSUS 61
FENDER, STUDIES IN THE CANTHARIDAE 63
PRATT, INSECT ENEMIES OF POLYPHYLLA CRINITA LEC. 69
COMPERE, A NEW METAPHYCUS PARASITIC ON PSYLLIDS 71
MICHELBACHER, WINTER HOST OF TOMATO MITE 73
MALKIN, RECORDS OF OREGON CHRYSOMELIDAE 74
USINGER, NEW NAME FOR A NEW ZEALAND ARADID 74
LINSLEY AND MICHENER, COLEOPTERA FROM MT. LASSEN 75
BOOK REVIEWS 62, 69

San Francisco, California
1943

THE PAN-PACIFIC ENTOMOLOGIST

EDITORIAL BOARD

E. C. Van Dyke, *Associate Editor*
E. G. Linsley, *Editor*
R. C. Miller, *Treasurer*
R. L. Usinger*
G. F. Ferris
E. S. Ross*

* *On military leave*

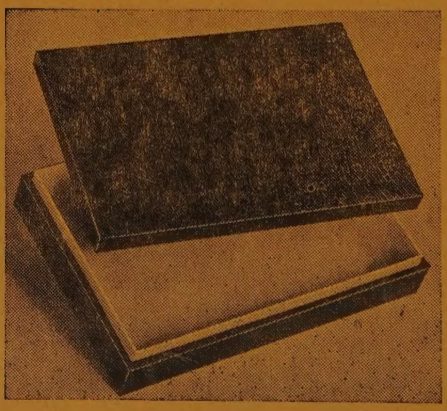
Published quarterly in January, April, July, and October with Society Proceedings appearing in the January number. Papers on the systematic and biological phases of entomology are favored, including articles up to ten printed pages on insect taxonomy, morphology, life history, and distribution.

Manuscripts for publication, proof, and all editorial matters should be addressed to the editor, E. G. Linsley, 112 Agriculture Hall, University of California, Berkeley, California. All communications regarding non-receipt of numbers, changes of address, requests for sample copies, and all financial communications should be addressed to the treasurer, R. C. Miller, at the California Academy of Sciences, San Francisco, California.

At least twenty-five "author's extras" will be supplied free of charge. Additional copies will be *reprinted* at cost of publication, if a request is received when proof is returned.

Domestic and foreign subscriptions $2.50 per year in advance. Price for single copies 75 cents. Make checks payable to "Pan-Pacific Entomologist."

INSECT BOXES



Standard size black insect box with sides of box and cover made of 1/4" redwood. The top, bottom and shoulders are of heavy cardboard.
Inside dimensions:
12¼x8¼x2⅛ inches.

Prices:
60 cents each.
Lots of one dozen, 50 cents each.

With Masonite bottom, 15 cents extra.
With glass top, 50 cents extra.

Prices for larger quantities on request.

Unit boxes also manufactured
Prices on application

RAISIN AND THIEBAUT BROS., LTD.

346 First Street, San Francisco, Calif.

Entered as second class matter, February 10, 1925, at the postoffice at San Francisco, California, under Act of August 24, 1912.

The Pan-Pacific Entomologist

Vol. XIX, No. 2 April, 1943

NEW SPECIES OF WEST AMERICAN COLEOPTERA

BY EDWIN C. VAN DYKE
California Academy of Sciences

This paper contains the descriptions of a number of new species of Coleoptera which have been acquired by the California Academy of Sciences, during the last few years, together with comments on other species.

Family Cleridae

Trichodes basalis Van Dyke, new species

Rather small and narrow; head, prothorax, base of elytra and legs clothed with long, stiff hairs as usual in the genus, the posterior portion of elytra with denser, shorter, semi-erect hairs, and the abdomen sparsely clothed with more or less recumbent pile; the greater part of head, prothorax and scutellum a metallic green, the elytra yellow at base, with a moderately narrow, transverse yellow bar at center, and oblique yellow stripes, diverging backwards and outwards and not quite meeting at suture, half way between median transverse band and apex, elsewhere a deep blue, the bluish patches in front and behind the median yellow bar faintly rufous at their centers and the apical patch somewhat rufous toward the apex, the front of head, antennae, legs and underside of after-body rufo-castaneous. Head coarsely, not closely punctured, clypeus smooth and shining, an inverted V-like impression between eyes, eyes of moderate size and quite prominent, the antennae with the usual triangular club and not quite twice as long as broad. Prothorax but little longer than broad, broadest in front, gradually narrower to posterior third, then constricted before base; the disk shining, rather coarsely, not cribrately punctured and with a small, smooth area in front of the scutellum. Elytra two-fifths as broad as long, with sides straight and parallel in front, feebly arcuate and narrowed toward the truncate apices; the disk rather coarsely, closely punctured, the punctures anteriorly arranged in more or less approximate rows, more irregular toward apex. Length, 8 mm.; breadth, 2 mm.

Male with antepenultimate ventral segment deeply emarginate posteriorly, the penultimate feebly emarginate and the apical somewhat arcuate at apex.

Holotype male (No. 5327, Mus. C. A. S. Ent.), collected in

IMPERIAL COUNTY, CALIFORNIA, in 1911, by J. C. Bridwell and by him kindly presented to me.

This very distinctively marked species, both in sculpturing and coloration, shows that it is more closely related to *horni* Woll. and Chap. than to any of the *ornatus* group. From *horni*, it is not only definitely separated by its color pattern but by being much less coarsely punctured above, with more prominent though smaller eyes, shorter antennal club and smaller size.

FAMILY ELATERIDAE

SUBFAMILY PLASTOCERINAE

Euthysanius wagneri Van Dyke, new species

Elongate, subparallel, rufotestaceous, somewhat shining, head, pronotum and ventral surface of entire thorax rather densely clothed with long, silky, fulvous pile, elytra rather densely clothed with shorter, semi-erect pile which, however, does not conceal the sculpturing, and the ventral segments with sparser, finer and more depressed pile. Head triangularly impressed in front, rather coarsely, closely punctured, the clypeal margin more or less lobed and slightly truncate at middle; eyes prominent, hemispherical; antennae reaching hind angles of prothorax, outer segments pectinate, the appendages long, about four times the length of the segments and terminal appendage fully as long as preceding one. Prothorax subcampanulate, length three-fourths breadth at middle and less than three-fifths width between apices of hind angles, front margin very feebly arcuate, sides slightly arcuate in front and oblique and divergent posteriorly to the long, sharp and widely everted hind angles which are carinate within; disk moderately convex, finely, not closely punctured, median line distinctly impressed. Scutellum elongate, depressed at middle and somewhat transverse behind. Elytra slightly less than three times as long as broad, sides gradually narrowing posteriorly; the disk convex, the striae well impressed and rather coarsely, closely punctured, the intervals convex and finely, irregularly punctured. Beneath, the propleurae rather coarsely, closely, punctured, prosternum finely rather closely punctured and sulcate between the coxae, ventral segments finely, rather densely punctured. Hind tibiae somewhat sinuate. Length, 22 mm.; breadth, 5.5 mm.

Holotype male (No. 5328, Mus. C. A. S. Ent.) and two male paratypes, collected at light, at MORRO, SAN LUIS OBISPO COUNTY, CALIFORNIA, July 4, 1931, by Mr. Roy L. Wagner, and kindly sent to me some years ago.

This species at first sight looks like a light colored *lautus*, seeing that it is of similar size and proportions. It differs from

this by having a finer, less dense pronotal punctuation, and from this as well as other species by having the basal angles of prothorax widely separated, divergent and acute, the clypeus more lobed in front, the forebody clothed with long, silky pile, and the terminal appendage of the antennae as long as the preceding appendages.

Aplastus piceus Van Dyke, new species

Elongate, stout, piceous, sparsely clothed above and beneath with short, closely appressed, gray pile. Head with triangular impression in front, coarsely, densely punctured; eyes prominent; antennae long, seventh segment reaching hind angles of prothorax, second and third segments short, the third but little longer than second, together about two-thirds length of fourth segment, segments 4-10 gradually wider from base to apex, the outer angle extended as a cylindrical appendage which is fully one-half the length of the segment, the eleventh segment long and cylindrical, slightly longer than the tenth and with a short appendage continuous with itself. Prothorax as long as broad, not including hind angles, apex arcuate, sides almost straight and slightly divergent to hind angles which are triangular, acute, carinated and generally continued straight backward and outward in line with the sides though frequently slightly everted, lateral margin generally well defined and complete though often obscure; disk rather coarsely, closely punctured, the median longitudinal line as a rule well impressed. Elytra three times as long as broad, sides almost straight, gradually narrowing backwards, and arcuate to apex; the disk with striae all distinctly impressed, the intervals feebly convex, the general surface finely punctured and rugous. Beneath, prothorax coarsely, closely punctured, the prosternum carinate in front and sulcate between the coxae, the ventral segments rather finely, discretely punctured. Length, 15 mm.; breadth, 4 mm.

Holotype male (No. 5329, Mus. C. A. S. Ent.), and numerous designated paratypes from a series of forty-nine specimens, collected by myself, in MORONGO VALLEY, RIVERSIDE COUNTY, CALIFORNIA, from May 23-26, 1941.

This species of the semi-arid hills to the east of the San Bernardino Range, is very similar in size and general appearance to *speratus* Lec. which is to be found in the more humid areas to the west of the mountains. The latter species is in general more rufous and has the outer segments of the antennae more definitely triangular and with the outer angle but little produced while *piceus* has the segments more narrowed basally and the outer angles extended in the form of an appendage. The

latter species also has the pronotum coarsely and closely punctured.

Larger series of *Aplastus speratus* Lec. than I formerly had, show that the lateral marginal line of the prothorax is well indicated in the larger, better developed specimens, and that it is only in the atypical or more poorly formed specimens that it is reduced. This would thus change the placement in my key (Proc. Calif. Acad. Sci., XX, 1932, pp. 459-460). *Aplastus piceus* would have to be placed near it.

Subfamily Elaterinae

Adelocera mexicana Candeze

In 1932, Dr. H. C. Fall described specimens of this species from Arizona as *A. nobilis*. This is an absolute synonym. While in Europe in the same year, I carefully examined the Candeze type in Brussels, also the specimen in the British Museum from which the illustration for the Biologio-Centrali Americana, was made. They were both from Mexico and both the same species and in agreement with the specimens from Arizona as well as Mexico that I have studied. If the specimen from Florida which Fall and Horn considered the true *mexicana* is different, then it is undescribed.

Conoderes bicarinatus Van Dyke

The specific name of this species, *bicarinatus*, is preoccupied by a species from Turkestan, *Conoderes* (*Heterodores*) *bicarinatus* Reitter. I, therefore, now substitute the name ***duplicatus*** Van Dyke, new name, for my species.

Conoderus (Heteroderes) amplicollis (Gyllenhal)

The specimens of *Conoderes* from Alabama which I formerly determined as the above, are really *laurentii* Guer. (*attenuatus* Cand.), according to specimens in the British Museum. In the Brussels Museum where much of the Candeze collection still is, there is considerable confusion. Specimens of the above are labelled *amplicollis* as well as *laurentii*.

Limonius cribriceps Van Dyke, new species

Rather short and robust, black, elytra and legs piceous, and clothed wtih a short and sparse yet conspicuous gray pile. Head flattened in front, coarsely, cribrately punctured, the clypeal front margin transverse and feebly reflexed; eyes of moderate size; an-

tennae rather short, extending but slightly beyond hind angles of prothorax, second and third antennal segments each about twice as long as broad, subcylindrical, together somewhat longer than fourth segment, 4-10 moderately serrate, gradually narrower, the terminal segment fusiform. Prothorax about as long as broad, apex feebly emarginate, base biemarginate, sides sinuate in front of hind angles, arcuate and gradually narrowed to apex, hind angles robust, projecting slightly backwards, truncate at apices and finely carinate; disk with median longitudinal line well impressed posteriorly, coarsely, deeply, rather closely punctured medially, approximately and cribrately at sides. Elytra fully 1 mm. more than twice as long as broad, sides subparallel in front, feebly arcuate posteriorly and gradually narrowed to apex; disk with striae well impressed and rather coarsely punctured, the intervals flattened, irregularly punctured and very rugose. Beneath coarsely and deeply punctured in front and less coarsely and densely on anterior ventral segments, the last ventral very densely punctured. Length, 10 mm.; breadth, 2.5 mm.

Holotype (No. 5230, Mus. C. A. S. Ent.), a unique, probably a female, collected by myself on the GREENHORN MOUNTAINS of TULARE COUNTY, CALIFORNIA, May 7, 1931.

In my synoptic table for *Limonius*, this species would come just before *confusus* Lec. and *plebejus* Say and following *kuschei* Van Dyke. In size and general appearance, it suggests *clypeatus* Mots. most but has a transverse clypeal margin. It is most notable because of its very coarse punctuation.

Limonius arizonicus Van Dyke, new species

Narrow, elongate, castaneous, antennae, legs, underside and epipleurae lighter, and sparsely clothed with short fulvous pile, longer on metasternum. Head rather coarsely, densely punctured, depressed at center in front, clypeus with sharply defined transverse margin; antennae long, the ninth segment reaching apex of hind angles of prothorax, second and third segments short though each longer than broad and together slightly longer than fourth, 4-10 moderately serrate, gradually narrowed outwardly, eleventh elongate-elliptical; eyes convex. Prothorax as long as broad at hind angles, sides gradually narrowed and feebly arcuate forwards, apex transverse, base bisinuate, hind angles rather short, slightly divergent, truncate at apices and with a fine carina which diverges forwards to a slight degree from the lateral margin; disk without definitely impressed median longitudinal impression, coarsely, approximately punctured at sides, more finely and sparsely punctured at center. Elytra about 1 mm. more than twice as long as broad and less than three times as long as prothorax, sides almost parallel in front, gradually arcuate and narrowed posteriorly;

disk feebly convex with striae finely impressed and finely, closely punctured, intervals flattened or feebly convex laterally and finely, irregularly punctured and rugose. Beneath, moderately punctured in front, the propleurae more coarsely and densely, the ventral segments moderately punctured, the apical more densely so; the prosternal sutures well separated in front and the prosternal lobe well developed. Length, 10 mm.; breadth, 2.75 mm.

Holotype (No. 5331, Mus. C. A. S. Ent.) and seven paratypes, all apparently males, collected in BEARFOOT PARK, alt. 8-9000 feet, CHIRICAHUA MOUNTAINS, ARIZONA, the type, July 15, 1937, the others July 9, 29, or 30, by J. A. Kusche.

This species though a true *Limonius*, in size and general appearance, looks more like an *Athous* such as *discrepans* Reitt. (*discors* Fall). In my synoptic table, it would run close to *confusus* Lec., to which it bears little resemblance. It is probably somewhat related to *rectangularis* Fall.

LIMONIUS DISCOIDEUS LEC.

I am still quite positive that *discoideus* is but the female of *canus*, occurring most commonly in the more northern areas of distribution. I have a pair mounted on the same pin, taken along Putah Creek, Solano County, California. The male is a typical male *canus* and the female a true *discoideus*. The usual female *canus* of the more southern areas of distribution is generally darker than typical *discoideus*. The latter is also not restricted to the north and intermediate color phases are not uncommon. I have *discoideus* from Trinity County, Tehama County, Humboldt County, Santa Cruz County, Monterey County, Calaveras County and Ventura County, California. Dr. Fall speaks of specimens of *canus* found on the sand dunes of San Francisco and Carmel and wondered whether it ranges farther north along the coast. I have taken it at numerous places, on the sand dunes along the coast from Redondo, California, to the State of Washington, as well as along numerous sandy washes of inland streams from southern California to Washington. Dr. Fall was not very familiar with field conditions in the more northern parts of the Pacific Coast. He also speaks of the possibility of *discoideus* being another species because certain males found with them had longer antennae than certain males found farther south. From my very long series, I find that the length of the antennae varies in the males, some from the south having long as well as short antennae while others from the north vary to

the same degree. *Limonius canus* Lec. is a species of wide distribution along the Pacific Coast, quite variable in many regards yet having a more or less definite biological habitat, that is the sandy wastes, whether of the seacoast sand dunes or the sandy margins of the various inland streams.

Limonius infuscatus Motschulsky

This species is, perhaps, even more widely distributed on the Pacific Coast than *canus* and more variable. Dr. Fall questioned my figures. My smallest *infuscatus* are 8 mm. long and I have many close to that figure. In fact the greater number of those to be found in middle California, as along the Russian River, presumably the type locality for Motschulsky's species (8.4 mm. long vid. Fall) are moderately small specimens. The average of the great majority is 10 or 11 mm. My excess figure was 14 mm. for *pilosulus* Caud. which I consider but a subspecies. I have in fact one *pilosulus* 16 mm. long while my smallest *pilosulus* is but 11 mm. long. Of *vernalis* Fall which I still consider but the lighter, more southern phase, I have twenty specimens before me, the smallest 8 mm., the largest 12 mm., average 10 mm. In my high school days, I collected them in quantities along the Los Angeles River channel. This is the phase which is common and widespread throughout the lowlands of southern California. In the mountains as at Keen Camp, Riverside County, the darker, more typical *infuscatus* is to be found. The average of specimens to be found in northern California, Oregon and Washington, is slightly greater than the Russian River specimens. As to *pilosulus* Cand. (*pilosus* Lec.) which is rare in collections, I will state that I have ten specimens before me, one of which I have carefully compared with the Le Conte type. It is 14 mm. long, larger than the type which is 10.5 mm., but it agrees with it in every regard except size. I also have two others of similar size and appearance. Five specimens are either 11 or 12 mm. long. Four of these are females like the largest specimens but one is a male. This last, from Los Angeles, has the antennae extending back to the hind prothoracic angles and the fourth and fifth segments are broadly triangular, not transverse as in the largest female and several of the smaller ones. All of the specimens have the same color and facies and I think are undoubtedly the same thing. Only one of these is from southern California, the male. The type was supposedly from Yuma. All

the others are from northern California: Sonoma County, Humboldt County, Santa Cruz County, Contra Costa County and Oroville. My largest specimen, 16 mm. long, is perhaps a different species for it is almost black, dull without metallic lustre, very hairy, and with the pronotum coarsely, densely punctured.

Ludius truculentus (Candeze)

This species, the type of which I examined in the Brussels Museum, is not what I judged as such from the description. Either my *shastensis* or *blaisdelli*, probably the latter, is more in agreement with the type of *truculentus*. Unfortunately I had no specimens of either *shastensis* or *blaisdelli* with me for purposes of comparison when abroad and comparison would be absolutely necessary to be certain of the determination. What I took to be *truculentus*, is without a name, so will be described.

Ludius sierrae Van Dyke, new species

Elongate, robust, moderately convex, rufo-castaneous, generally with a broad, black, longitudinal stripe down the center of the pronotum, though this is often vague and sometimes absent, the base of head also sometimes black and the prosternum and underside of entire after body more or less piceous, and both upper and lower surfaces clothed with a sparse, short, closely appressed though quite evident pubescence. Head feebly convex, sometimes with two shallow impressions between the eyes and densely closely punctured, antenna piceous, extending several segments beyond hind angles of prothorax in males and one or two in female, second segment short, slightly longer than broad, third almost twice as long and but little shorter than fourth, 5-10 gradually shorter and narrower and 4-10 all feebly serrate. Prothorax as broad as long, not counting hind angles, sides arcuate from apex to base of hind angles, hind angles prominent, acute, divergent, with sharply defined carinae and fully 1.5 mm. long; disk broadly convex, slightly deplanate laterally, with median longitudinal impression generally vague, and finely, rather densely punctured, especially at sides, and lateral margin very narrow. Elytra over twice as long as broad and less than three times as long as prothorax, sides almost straight and parallel at basal third, thence feebly arcuate and gradually narrowed toward apex; the disk with striae finely but well impressed and finely somewhat obscurely punctured, the intervals broad, feebly convex and finely punctured and rugose. Beneath finely closely punctured, denser on prothorax. Length, 12-20 mm.; breadth, 4-6 mm.

Holotype male, allotype female (Nos. 5332 and 5333, Mus. C. A. S. Ent.) and four paratypes, the first from Meadow Val-

LEY, PLUMAS COUNTY, CALIFORNIA, 3500-4000 feet alt., June 6, 1924; the second from FALLEN LEAF LAKE, near LAKE TAHOE, CALIFORNIA, July 12, 1915; and the others from Quincy, California, July, 1922; Yosemite Valley, California, June 3, 1921; and El Dorado County, California; all collected by myself. There is also an additional specimen from Glen Alpine, near Lake Tahoe, California, collected in July, in the Fenyes collection of the Academy.

This species which has long confused me, looks very much like some of the bicolored specimens of *volitans* Esch. from Alaska and the northern Cascade Mountains, but it is in general more robust, with a shorter and broader prothorax, less sagittate, smaller prothoracic hind angles, and above all with the third antennal segment not quite as long as fourth whereas it is always fully as long or longer in *volitans*. True *volitans* are to be found in the same general region as *sierrae*, the mid Sierra Nevada Mountains.

LUDIUS CRIBROSUS (LE CONTE) AND RELATIVES

In my paper of 1932, I was too hasty in placing *cribrosus*, *maurus* and *colossus* as phases of one species. They are, of course related, the two first very closely so and often difficult to separate. The male genitalia of these are so similar that they cannot be relied upon for purposes of diagnosis. The antennae of atypical smaller females, likewise, cannot be depended upon. The two species are also to be found in the same regions. Typical *cribrosus* have the pronotal punctures generally deep and well separated on the disk, the third segment of the antennae almost as long as fourth and quite triangular, and are as a rule more shining. Typical *maurus* Lec. are usually broader, flatter, have the pronotal punctures close together, more approximate, the third segment of the antennae more cylindrical, feebly triangular, and as a rule shorter though many have it practically as long as the fourth, and are duller in appearance. The male genitalia of *colossus* Lec. are different from either of the others, the lateral blades of the aedeagus narrower and knobbed apically; the antennae are more like those of *maurus* but have the outer segments more transverse and broader basally; the pronotal punctation much like that of *cribrosus*; and the elytra with striae very finely, often obscurely impressed and the intervals flat and rather densely punctured. It is the elytra in the smaller

specimens which are no larger than many *maurus*, which have to be used to enable these to be definitely separated from *maurus*. At first only very large female specimens of *colossus* were known or at least recognized but more recently more specimens have been found, including many smaller specimens and both males and females, though the males are still quite rare. As stated previously, I find that this species is restricted to the southern Sierras.

LUDIUS NIGRICANS (FALL)

A restudy has convinced me that the above species is a good species not a subspecies of *rotundicollis* (Say) as I at first thought and stated. In general it is larger. I have, however, specimens that are no larger than average examples of *rotundicollis* and specimens of *diversicolor* Esch. which are fully as large as minor sized specimens of *nigricans*. The pronotal punctuation is variable and so unreliable as an index. In typical *nigricans*, it is moderately coarse and dense, in other specimens fine and less dense, approaching that of *rotundicollis*. The more reliable diagnostic characters are the somewhat flattened pronotum, rather broadly sinuate sides in front of the moderately robust hind angles which may be either slightly or conspicuously divergent, and the fairly wide side margin of the prothorax, especially posteriorly. In *rotundicollis*, the pronotum is more convex, with the sides narrowly and sharply sinuate just in front of the short, acute and divergent hind angles, and the side margin of the prothorax very fine and narrow throughout. I have a color phase of *nigricans* with broad red margins to the prothorax, from Olympia, Washington.

LUDIUS ROTUNDICOLLIS (SAY)

The typical phase of this according to Fall, and Say's original description which I neglected to consult at first, has a more or less rufous pronotum, I would call it a dark cherry red. I now have before me several specimens of this typical phase from the Fenyes collection, as well as all black specimens, one from the Pacific Coast, Olympia, Washington. The *diversicolor* of Eschscholtz is not the same as *rotundicollis*, therefore not a synonym as stated by Fall but a good subspecies as formerly stated by me. In fact, I very much doubt whether Dr. Fall had ever seen a true *diversicolor*. Outside of having a brilliant orange pronotum, it has the elytra a more pronounced, shining black and the fine, close punctuation of the elytral striae quite evident

whereas it is more or less obsolete in typical *rotundicollis*. This subspecies is generally to be found in the middle, coastal region of California and as far as I have found, breeds in the old rotting wood in the holes of injured live oak trees. There is also a color phase of this, characterized by having a longitudinal black area of variable size down the middle of the pronotum. This phase, so far, only has been found about Monterey Bay in California.

ELATER STURMII GERMAR

The type of the above-mentioned species is in the British Museum and is a true *Megapenthes*.

MELANOTUS LONGULUS LE CONTE

In my previously-mentioned paper, I sunk *M. oregonus* Lec. as a subspecies of the above. I was in error. *M. oregonus* Lec. is a good species with different male genitalia. The other forms which I included under *longulus*, belong as placed.

FAMILY MELASIDAE

Hylus (Hypocoelus) robustus Van Dyke, new species

Form robust, moderately elongate; piceous, antennae, legs, generally the abdomen and sometimes the entire underside rufous; sparsely clothed with fine, fulvous pile. Head convex, flattened in front, sulcate between the antennae, clypeus narrowed at base, transversely concave, the entire head coarsely, densely umbilicately punctured; antennae with the seventh segment reaching hind angles of prothorax, second segment small, transverse apically, segments three and four feebly triangular and twice as long as broad, the following cylindrical and slightly more than twice as long as broad, the terminal segment slightly longer than tenth and acute at apex. Prothorax barely wider than long, apex feebly lobed, sides arcuate from hind angles and gradually narrowed to apex, base broadly emarginate on either side and with a short transverse area between; disk convex, with median longitudinal line barely impressed near base, the surface coarsely umbilicately punctured. Elytra finely striate, the strial punctures more or less vague, the intervals flat and finely, irregularly and somewhat densely punctured and finely rugose. Beneath, prosternum rather coarsely, densely punctured. The abdomen more finely and less densely punctured. Hind coxal plates triangular, gradually dilated inwardly, the hind margin straight. Length, 8 mm.; breadth, 3 mm.

Male: terminal segment of antennae evidently but very little longer than tenth; female, terminal segment of antennae equal to tenth.

Holotype male, allotype female (Nos. 5334 and 5335, Mus. C. A. S. Ent.) and three paratypes; the holotype male from near

KAWEAH, TULARE COUNTY, CALIFORNIA, August 11, 1939; the allotype female, same locality, August 2, 1937; two paratypes, same locality, August 11, 1939 and August 3, 1937; all collected by F. T. Scott; the third paratype collected by A. T. McClay at Palloch Pines, California, May 6, 1937.

This species as indicated by its name is very robust. In the tables, it would run close to *frontosus* (Say), but differs by being larger and more robust with the head and pronotum very coarsely, cribrately and umbilicately punctured and the head much flattened in front. In one specimen, the one from Pollock Pines, there is a small, rudimentary, longitudinal crista on the front of head. The species is the fourth in the genus to be described from North America: *frontosus* (Say) from eastern Canada and adjacent areas of the United States; *terminalis* (Lec.) from the same localities and on the Pacific Coast from British Columbia, Washington and northern California; and *californicus* (Van Dyke) and *robustus* Van Dyke, both restricted to California; thus, showing that northwestern North America is the center of distribution for this continent.

ZUPHIUM AMERICANUM DEJ. IN OREGON

On April 29, 1942, a series of ten specimens of this tiny Carabid was taken as Spencer's Butte, 5 miles south of Eugene, in an open meadow at the altitude of 900 feet.

The beetles were found clinging to an overturned stone in somewhat Cucuid manner, but when disturbed by light they became very active and rapidly descended to the ground where some succeeded in hiding themselves under particles of soil and escaped collector's hand.

The state of Louisiana is cited in Leng's catalogue as the habitat of the species, but Dr. Hatch, who has kindly determined the beetles, has informed me that there is in his collection a specimen from Ann Harbor, Michigan. Apparently the distribution of the *Zuphium americanum* is quite extended[1] although it is rarely found in collections.

Out of the total ten, two specimens are placed in the collection of Mr. and Mrs. Kenneth Fender of McMinnville, Oregon, four in Dr. Hatch's collection, and the remainder in my own.—BORYS MALKIN.

[1] Four examples from Kansas in the Field Museum of Natural History, Chicago, have been examined since the above was written.

FIVE NEW SPECIES OF DICYPHUS FROM WESTERN NORTH AMERICA AND ONE NEW CYRTOPELTIS

(Hemiptera, Miridae)

BY HARRY H. KNIGHT
Iowa State College, Ames, Iowa

Dicyphus brachypterus Knight, new species

Male. Length 2.55 mm., width .75 mm. Head: width .48 mm., vertex .23 mm.; black, shining, a pale lunule extending from postero-dorsal angle of eye to near middle of vertex. Rostrum, length 1.04 mm., extending to tips of middle coxae, pale yellowish, apex fuscous. Antennae: segment I, length .26 mm., pale, fuscous on base; II, .86 mm., cylindrical, pale, base and more broadly on apex, blackish; III, 1.0 mm., pale, apical half fuscous; IV, .49 mm., fuscous. Pronotum: length .47 mm., width at base .60 mm.; calli convex, posterior margins moderately impressed; basal margin of disk concavely arcuate, basal angles moderately rounded, black, shining, collar white. Scutellum slightly convex, transversely rugulose, mesoscutum moderately exposed, black. Hemelytra abbreviated, reaching to middle of abdomen, membrane reduced, scarcely extending beyond tip of cuneus, pale; pallid, subtranslucent, a fuscous cloud covering tip of clavus and apical half of corium. Body black, moderately shining, clothed with fine pale to yellowish pubescence. Legs pale, base of coxae blackish, apical half of femora slightly dusky, tibial knees and tips of tarsi fuscous.

Female. Length 3.11 mm., width .92 mm. Head: width .58 mm., vertex .32 mm. Antennae: segment I, length .26 mm.; II, .71 mm., less than one and one-half times the width of head; III, .82 mm.; IV, .39 mm. Pronotum: length .57 mm. width at base .74 mm. Hemelytra short, membrane extending slightly beyond tip of cuneus, pallid, subtranslucent, a fuscous cloud covering apical half of corium and apical one-fourth of clavus. Color very similar to the male, but with a pale spot between calli and extending slightly on pronotal disk.

Holotype: male, August 14, 1931, Mt. Rainier, Washington (H. H. Knight); author's collection. *Allotype:* same data as the type. *Paratypes:* 2 males and 6 females, taken with the types on *Polemonium humile* R. & S. This species was found on the same plants with *Macrotylus polemonii* Kngt.

Dicyphus usingeri Knight, new species

Distinguished from allied species by the large size, green to yellowish coloration, with first antennal segment black.

Male. Length 5 mm., width 1.2 mm. Head, width .60 mm., vertex .32 mm.; frons strongly convex, tylus prominent; eyes rather small, width .19 mm., height .28 mm.; yellowish green. Rostrum, length 1.90 mm., reaching to middle of hind coxae, greenish yellow, apex blackish. Antennae: segment I, length .47 mm., blackish, apex and narrow base yellowish; II, 1.82 mm., slender, slightly thicker apically, thickly clothed with suberect, fuscous pubescence, yellowish, base and apex fuscous to black; III, 1.90 mm., slender, blackish; IV, .60 mm., blackish. Pronotum: length .65 mm., width at base .99 mm.; calli moderately convex, posterior margins not deeply impressed, posterior half of disk rather flat, basal margin straight; yellowish green, basal edge of disk infuscated. Scutellum moderately convex, greenish yellow, apex dusky; mesoscutum moderately exposed. Hemelytra subtranslucent, pale to yellowish, apex of corium with a small fuscous cloud; cuneus clear, tinged greenish, apex dark fuscous to blackish; membrane nearly clear, venis pale fuscous. Dorsum clothed with suberect, moderately close-set, dusky to fuscous pubescence. Ventral surface yellowish to green, fading in old specimens. Legs greenish yellow, tarsi and tibial knees fuscous to black; tibial spines blackish. Left genital clasper subtriangular on basal half, convex on lateral aspect, apical half flattened, blade-like, directed vertically, apex acuminate; right clasper not visible externally.

Female. Length 4.5 mm., width 1.17 mm. Head: width .58 mm., vertex .34 mm. Antennae: segment I, length .43 mm.; II, 1.43 mm.; III, 1.34 mm.; IV, .56 mm. Very similar to the male in general form, color and pubescence.

Holotype: male, June 20, 1926, Fresno, California (C. J. Drake); author's collection. *Allotype*: taken with the type. *Paratypes:* female, taken with the types. CALIFORNIA: 10 males and 14 females, July 20, 1928, Oakland Rec. Camp, Tuolumne County; 4 males and 14 females, July 23, 1932, nr. Camino, El Dorado County (R. L. Usinger). One male, May 21, 1930, Mokelumne Hill, Calaveras County; a male and a female, July 20, 1931, Coffee Creek, Trinity County (R. L. Usinger). Breeds on Mountain Misery (*Chamaebatia foliosa* Benth.) according to Dr. Usinger.

Dicyphus rivalis Knight, new species

Allied to *usingeri* but differs in having smaller eyes, the calli more strongly convex, and first antennal segment greenish.

Female. Length 5.5 mm., width 1.5 mm. Head: width .64 mm., vertex .39 mm.; frons strongly convex, higher than base of head; eyes small, width .173 mm., height .25 mm.; color greenish yellow. Rostrum, length 2 mm., extending to middle of hind coxae, yellow-

ish, apex fuscous. Antennae: segment I, length .50 mm., greenish yellow, fuscous beneath on basal half; II, 1.73 mm., slender, cylindrical, yellowish, blackish at base, infuscated just before apex; thickly clothed with suberect, yellowish pubescence; III, 1.78 mm., yellowish, dusky to fuscous apically; IV, .64 mm., fuscous. Pronotum: length .78 mm., width at base 1.08 mm., calli strongly convex, posterior margin moderately impressed; posterior half of disk moderately convex, basal margin moderately concavely arcuate, posterior angles broadly rounded. Scutellum moderately convex, mesocutum rather broadly exposed, both uniformly greenish yellow. Hemelytra subtranslucent, pale yellowish, tip of cuneus fuscous; membrane nearly clear, veins greenish, infuscated at apex of cells. Dorsum clothed with suberect, moderately close set, yellowish pubescence. Ventral surface uniformly greenish yellow. Legs greenish yellow, tibial knees black, tips of tarsi fuscous, tibial spines yellowish.

Holotype: female, June 16, 1930, Forest Grove, Oregon (Joe Schuh); author's collection. *Paratype*: female, September 16, Kaslo, British Columbia. CALIFORNIA: female, July 28, 1931, Coffee Creek, Trinity County (R. L. Usinger), on *Ribes.*

Dicyphus tinctus Knight, new species

Allied to *rufescens* Van D., but distinguished by the red pronotum and scutellum, cuneus clear without black apex, tibiae and abdomen pallid.

Female. Length 4.33 mm., width 1.2 mm. Head; width .62 mm., vertex .35 mm.; fuscous to black, a pale spot above each eye on vertex. Rostrum, length 1.47 mm., reaching to near apex of middle coxae, pale, apex fuscous. Antennae: segment I, length .32 mm., pale to dusky; II, 1.05 mm., cylindrical, pale to dusky, fuscous at base; III, 1.12 mm., pale to dusky, apical one-third fuscous; IV, .47 mm., pale to dusky. Pronotum: length .65 mm., width at base .99 mm.; basal margin rather deeply and broadly concave, calli rather strongly convex; color bright red, coxal cleft surrounded by fuscous. Scutellum and mesonotum bright red, the latter rather broadly exposed. Hemelytra pale translucent, apical half of clavus, inner and apical margins of corium, bright red. Cuneus uniformly clear, inner edge by smaller areole with a streak of red. Membrane nearly clear, tinged with brownish, veins light fuscous. Dorsum clothed with fine, rather short, suberect pale pubescence. Venter pale, a series of dark spots on lateral margins; mesosternum, metapleura and ostiolar peritreme, dark fuscous to black. Legs pale to yellowish, spot on base of front coxae, a series of obsolete spots on anterior face of hind femora, and tips of tarsi, fuscous.

Holotype: female, August 10, 1932, Lodgepole Camp, Rainier National Forest, Washington (A. R. Rolfs); author's collection. *Paratypes:* 4 females, taken with the types.

Dicyphus hesperus Knight, new species

Allied to *discrepans* Kngt., but the male differs in structure of the left genital clasper; lateral aspect of clasper triangular in outline and without a notch on dorsal margin near base; female distinguished by the black first antennal segment.

Male. Length 3.55 mm,, width 1.03 mm. Head: width .52 mm., vertex .23 mm.; black, shining, vertex bordering eyes and dorsal aspect of neck except median line, pallid. Rostrum, length 1.47 mm., extending beyond posterior coxae or to base of fourth ventral segment, pale yellowish, apex fuscous. Antennae: segment I, length .26 mm., reddish brown to black, shining, yellow pubescent; II, .86 mm., yellowish, apical one-third dark reddish to black, basal half more slender, pale yellowish pubescent; III, .52 mm., dark fuscous, pale at base; IV, .34 mm., fuscous. Pronotum: length .49 mm., width at base .82 mm.; collar flat, broad, sinuate above, pale; calli convex, smooth, shining, basal margin delimited by an impressed line; disk flaring upward over mesonotum, basal margin broadly, concavely arcuate, basal angles widely rounded; propleura fuscous to black, calli brownish, disk dusky brown, median line pale. Mesoscutum broadly exposed, fuscous, pale spot at each side; scutellum pallid, broad median line reddish brown to black. Dorsum clothed with yellowish to fuscous pubescence, with more erect fuscous hairs on pronotum and scutellum. Hemelytra subtranslucent, in part dusky brown, tinged with reddish along claval suture, sometimes more broadly; spot on tip of embolium and one on corium bordering cuneus, fuscous to black. Cuneus clear, apex fuscous to blackish, often tinged reddish. Membrane clear, apical half lightly infuscated, veins fuscous. Venter and thorax brownish black. Legs pale to yellowish, coxae fuscous on base; femora with a few fuscous dots arranged in rows, front femora with spots on posterior aspect while hind femora have spots on front and posterior aspects; tibiae with yellowish hairs only, tips of tarsi fuscous. Left genital clasper triangular as viewed from the side, without notch above, apical half slender, apex flattened and curved; right clasper apparently absent.

Female. Length 3.5 mm., width 1.0 mm. Head: width .56 mm., vertex .22 mm. Antennae: segment I, length .26 mm.; II, .73 mm.; III, .58 mm.; IV, .30 mm. Very similar to the male in form and coloration.

Holotype: male, April 19, 1933, Moscow, Idaho (T. A. Brindley); author's collection. *Allotype:* same data as the type. *Paratypes:* 2 males and 3 females, taken with the types in mullein (*Verbascum*) where this insect may hibernate. CALIFORNIA: 2 males, and 2 females, July 4, Arbolado, on *Stachys albens*; 2 males and 2 females, May 7, San Gabriel River; male and 3 females, May 16, 1935, Whittier, on *Verbascum virgatum* (E. L. Paddock). One female, June 12, 1918, San Diego (C. L. Hubbs). Two males and 2 females, June 1, 1940, Dark Canyon, Riverside County (R. L. Usinger), "on thimbleberry"; 2 males and 2 females, June 2, 1915, Mission Canyon, Santa Barbara (Harold Morrison). Eight males and females, August 15, 1914, Ramona (J. C. Bradley). COLORADO: 2 females, July 16, 1898, Little Beaver; female, June 18, 1901, Palmer Lake (E. D. Ball). IDAHO: 5 females, Nov. 17, 1933, Boise (C. Wakeland). Six males and females, May 23, 1936, Genesee (T. A. Brindley). Male and female, April 22, male and female, May 30, 1933, Lewiston (T. A. Brindley). Five males and females, July 10, 1936, Lewiston (F. B. Conn). Male, March 31, male and female, April 4, male and female, April 18, 5 males and females, April 14, male and female, May 7, female, Oct. 20, 1932-1938, Moscow (T. A. Brindley). Five males and females, Mar. 17, 1934, Moscow (H. G. Bergen). Seven males and females, Mar. 18, 1934, Moscow (H. Shipman). Male, May 10, 1936, Moscow (R. E. Miller). Male July 10, male July 24, 2 females August 8, 1936 Moscow (B. F. Conn). Male May 17, male and female June 18, 1936, Moscow Mountain (T. A. Brindley). Nine males and females, Aug. 4, 1936, Moscow Mountain (Shull and Coon). MONTANA: Male, August 1, 1920, Missoula (A. A. Nichol). NORTH DAKOTA: female, Bottineau, Turtle Mountains (C. N. Ainslie). OREGON: female, May 27, 1930, Corvallis (H. A. Scullen). Male, July 3, 1926, Le Grande (E. W. Davis). UTAH: female, June 13, 1940, Mt. Timpanogos, alt. 6,800 ft. (C. L. Hayward). WASHINGTON: male and female, April 18, 1930, Clarkston (H. Woods), on tomato. Two females, July 9, 1937, Dayton (R. E. Miller). Five males and females, Nov. 21, 11 males and females, Dec. 11, 1925, Toppenish (E. W. Davis). Two males May 4, 1 male Aug. 29, 1 male Sept. 20, 1932, Yakima (A. R. Rolfs).

Cyrtopeltis bakeri Knight, new species

Distinguished from allied species by the black prothorax, short second antennal segment, and by the anteapical black spot on cuneus.

Female. Length 3.7 mm., width 1.2 mm. Head: width .57 mm., vertex .28 mm.; rather short, eyes large (width .22 mm., height .30 mm.), black, a triangular pale spot at top of eye on vertex. Rostrum, length 1.35 mm., extending to tips of middle coxae, pale, apex blackish. Antennae: segment I, length .25 mm., black, narrow apex pale; II, .69 mm., cylindrical, slightly more slender toward base, clothed with fine yellowish pubescence, pale yellowish, base blackish, apex fuscous; III, .68 mm., pale to dusky; IV, .38 mm., dusky. Pronotum: length .58 mm., width at base .95 mm.; black, basal margin broadly, concavely sinuate, lateral margins slightly sinuate, rounding over to the propleura; calli very slightly convex, margins not impressed, on a level with the broad basal half of disk; collar flat to slightly convex. Dorsum clothed with short, suberect, pale pubescence. Mesonotum moderately exposed, black, brownish at each side; scutellum moderately convex, black. Hemelytra subtranslucent in pale areas; clavus except basal angles, and inner apical area of corium uniformly dark fuscous; cuneus clear, apical half with a central, triangular black spot which leaves the apex broadly and narrow lateral margins clear. Membrane uniformly pale fuscous, basal half darker, a small clear spot by apex of cuneus. Thorax and venter black, legs yellowish, bases of coxae and tips of tarsi blackish; pubescence yellowish, tibial spines fuscous.

Male. Length 3.64 mm., width 1.04 mm. Head: width .56 mm., vertex .26 mm. Antennae: segment I, length .21 mm., fuscous, apical half paler; II, .69 mm., fuscous, becoming pale on apical half. Pronotum: length .54 mm., width at base .90 mm. Color and pubescence very similar to that of female. Genital segment twisted to the left side so that left genital clasper appears to arise on median ventral line of segment; left clasper sickle-shaped, the apex slightly broader and pointing to the left side; right clasper minute or absent.

Holotype: female, September 10, 1931, Sunrise, alt. 6,380 ft., Mt. Rainier, Washington (Wm. W. Baker); author's collection. *Allotype:* male, May 5, 1935, Alsea Mountain, Oregon. *Paratypes:* OREGON: male, April 21, 1935, Tidewater (Joe Schuh). WASHINGTON: female, July 9, 1930, "Wen. Mts."; female, Aug. 31, 1930, Yakima; female, Aug. 15, 1932, Tampico (A. R. Rolfs). BRITISH COLUMBIA: 2 males and 1 female, Aug. 9, 1905, Downie Creek, Selkirk Mts. (J. C. Bradley).

OBSERVATIONS ON THE SAND DUNE CHINCH BUG *BLISSUS MIXTUS* BARBER

(Lygaeidae Hemiptera)

BY BARBARA PRENDERGAST
California Academy of Sciences

According to early reports on the true chinch bug, *Blissus leucopterus* Say, this notorious insect occurred scantily in the Pacific States, although it has never been reported as destructive west of the Rocky Mountains. Webster ("The Chinch Bug," U.S.D.A. Cir. no. 113, 1909) reports the chinch bug from the coast and the central valleys of California, but no specimens from the Sacramento or San Joaquin valleys are available in western collections, and the experience of collectors would indicate that *Blissus* is limited to sand dune areas along the coast, at least in northern California.

In 1939, Barber clarified the taxonomic status of the various forms of *Blissus* occurring in the United States. He described the coastal California species as new (Proc. Ent. Soc. of Wash., v. 39, No. 4, 1937, p. 85), basing it upon a small series of brachypterous specimens only.

Blissus mixtus Barber appears to be very abundant in the sand dune areas along the Pacific Coast of the San Francisco peninsula. Colonies were observed at weekly intervals during a year's time. The host plant is *Ammophila arenarius* (determined by Alice Eastwood), a beach grass which grows abundantly in this vicinity. The grass was introduced by seed from Europe to prevent the sand from shifting.

The bugs are gregarious, occurring in large numbers on particular plants, and appearing to skip other clumps of the same grass entirely. They live near the roots and among the sheaths of the stems and seem to occur only on rather dry plants. It is difficult to distinguish the bugs from debris and sand, especially beneath the roots, since the adults are nearly identical in color with damp sand. In addition, they have a tendency to feign death when disturbed. It is only when they wriggle into activity that they may be readily detected and captured. During all seasons of the year bugs were found abundantly.

It was interesting to note the presence of first instar nymphs in the sand dunes early in January. Since the egg stage lasts

about a month under laboratory conditions, a field generation must begin about the first of December.

Several attempts to culture the species in the laboratory failed, although the technique described by Janes (Ann. Ent. Soc. of Amer., v. 28, No. 1, pp. 109-120) for the true chinch bug was followed. Colonies were established on the host plant but not on wheat and barley, although cultures were maintained on these plants long enough to indicate that the bugs are probably not of economic importance to them.

Couplating pairs were closely observed in vials. After an interval of one month, a single egg was laid in each case. After the lapse of another month, the eggs hatched. The first instar nymphs were pale pinkish, changing to red. With each successive moult the color became darker and more brownish, finally attaining the drab infuscation of the adult.

The most significant biological facts observed were: 1) that the ratio of brachypterous to macropterous forms was about equal; 2) that *Blissus mixtus* does not migrate, nor does it hibernate during the winter months; 3) that there are three generations each year in contrast to the two generations so typical of *Blissus leucopterus* Say.

In conclusion the writer suggests as a possible explanation for the absence of a migration and hibernation period in the life of *Blissus mixtus*, the ecological uniformity and an abundance of the host plant in the area in which this species occurs. In view of the fact that this period is not taken up by such a process, production of an additional generation is probably induced at this time.

TYPES OF APTEROUS ARADIDAE

Dr. Oscar Monte of the Instituto Biologico de Sao Paulo, Brazil, sent a valuable collection of Brazilian Aradidae for study with the understanding that the types of new species would be deposited in the collection of the Instituto Biologico.

In my recent paper on apterous Aradidae (Pan-Pac. Ent. 17: 169-181, 1941) the types of *Notoplocoris montei* and *Emydocoris testudinatus* were inadvertently given type numbers in the collection of the California Academy of Sciences. These types have now been returned to the Instituto Biologico de Sao Paulo.—R. L. USINGER.

BEROSUS EXILIS LECONTE A HEMIOSUS[1]
(Coleoptera, Hydrophilidae)

BY HUGH B. LEECH
Vernon, British Columbia

An examination of specimens of Le Conte's *Berosus exilis* shows that the species belongs in the genus *Hemiosus* Sharp, 1882 (Biol. Centr.-Americana, Coleopt., 1 (2):84-85). Sharp proposed *Hemiosus* for his *H. maculatus* from Guatemala, Panama and Mexico; since then at least four Brazilian species have been added to the genus. Several of the characters which Sharp relied upon to distinguish *Hemiosus* from *Berosus* are specific rather than generic, but differences in the forms of the mesosternal protuberance and the male genitalia are reliable.

In *Berosus* the mesosternal process varies in its degree of prominence, but is always thin and blade-like, usually falcate anteriorly (hooded in *B. rugulosus* Horn); the aedeagus and parameres are in great part sheathed in a large trough-shaped basal piece. In *Hemiosus* the mesosternal process broadens anteriorly from just in front of the mesocoxae, then narrows again to a blunt point, and this broadened area is deeply excavated; the aedeagus and parameres are only partially enclosed at the foot by a small basal piece.

The rare *Hemiosus exilis* (Leconte) 1852, is 2.5-3 mm. long, and has the pronotum largely metallic green, with the front and side margins broadly and the base narrowly, pale. These distinctive characters have confused it with a small *Berosus*, previously unrecorded from north of Mexico. The two may be separated as follows:

Mesosternal protuberance broadened anteriorly and deeply excavated; form oblong oval; elytra pale yellowish-white with indistinct brown maculations, punctures of intervals much smaller than those of striae; pronotum with large and small punctures intermixed; emargination of fifth abdominal sternite with a single tooth at middle.....*Hemiosus exilis* (Leconte)

Mesosternal protuberance thin, blade-like; form broadly oval; elytra yellowish-brown, each elytron with distinct black spots: one at humerus, one near suture just before middle and usually one just behind middle, and one laterally just behind middle; punctures of elytral intervals almost as large as those of striae; pronotum without small punctures between the large

[1] Contribution No. 2196, Division of Entomology, Science Service Department of Agriculture, Ottawa, Ontario.

ones; emargination of fifth sternite with two small teeth at middle.....*Berosus moerens* Sharp

The type locality of *H. exilis* (Leconte) 1852, is the Gila River at Pima, Arizona (see Leconte, 1855, Proc. Acad. Nat. Sci., Philadelphia, 7:366); my specimens are from Phoenix, Arizona, collected May 7, 1918, by J. Chester Bradley. *B. moerens* Sharp, 1882, was described as from Oaxaca, Mexico, and Guatemala; I have examples from 1 mile north of Ft. Davis, Davis Mountains, Texas, July 16, 1941 (B. E. White), and have seen one from the Huachuca Mountains, Arizona, July (D. K. Duncan). It also occurs in Lower California.

College Entomology

College Entomology. By E. O. Essig. The Macmillan Company, N. Y. vii + 900, 308 figures. 1942. Price $5.00.

College Entomology sets forth in Professor Essig's marvelously detailed style the fundamental features of insects. The opening chapters deal with the basic subjects, metamorphosis and anatomy. A tabular arrangement and a key to the orders of insects follow. These introduce the systematic section of the book, which consists of thirty-three chapters. These chapters vary in length with the size and importance of the various orders. Each order is treated according to a consistent plan including such noteworthy features as the etymology and priority of ordinal names and a tabular arrangement of ordinal characteristics. The latter are divided into columns on external and internal characters and further segregated into special features. Important families are characterized and outstanding species occurring throughout the world are mentioned. Synoptic keys are provided for superfamilies and families. Selected references are conveniently grouped at the end of each chapter and general references are placed at the end of the book.

A characteristic feature of any Essig book is the exhaustive index. A five-page "Index of Authors" and a sixty-three-page subject index, both arranged in three columns, carry on this feature and are models of clarity and detail. Here, as elsewhere, it is evident that author and publisher have cooperated closely in choice of type faces to differentiate names of genera, species, and higher groups. The frequent use of bold-face type is in keeping with the thoroughly modern format and gives a clear and pleasing appearance. One of the outstanding features of the book is the series of entirely original anatomical illustrations. These, as a group, are without equal in any other text book of general entomology known to me.

College Entomology has already taken its place as a refreshingly modern manual for the study of insects and as another of the fine contributions of E. O. Essig to Entomology.—R. L. Usinger.

STUDIES IN THE CANTHARIDAE
(Coleoptera)

BY KENNETH FENDER
McMinnville, Oregon

In the course of revisional studies of the genera of the Cantharidae, exclusive of the genus *Cantharis*, a number of new species have come into my possession, a few of which are herein described. It is hoped that these studies, along with those of Mrs. Dorothy Fender and Mr. J. W. Green[1] in the genus *Cantharis*, will give a better understanding of this neglected group. To facilitate comparisons with previous descriptions, I have tried to follow the style and terminology of previous students of the family.

Chauliognathus texanus Fender, new species

Yellow: tibiae, tarsi, apical fourth to half of femora and apical third of elytra black; tibiae sometimes yellowish. Antennae piceous to yellowish, basal segment piceous in all specimens examined; third segment a little shorter than the fourth; the apex of each segment with a ring of long fine hairs, setaceous in *profundus*; scattered long hairs on the body of each segment. Head elongate oval, shining, finely punctured and sparsely pubescent. Thorax opaque, wider than head; nearly as long as wide in the male; wider in the female; sides evenly arcuate and shallowly reflexed; disc usually with an elongate black spot on each side, sometimes absent. Elytra slightly wider than thorax, parallel, moderately punctate and sparsely pubescent. Terminal segments of abdomen pale, with black markings in *profundus* and *ineptus*. Length, 13 to 17 mm.

Holotype, male, DAVIS MOUNTAINS, TEXAS, August 2, 1937; allotype, female, CHISOS MOUNTAINS, TEXAS, July 9, 1936; three paratypes, same data as allotype; three other paratypes from DAVIS MOUNTAINS, TEXAS, July 2, 1940; three paratypes from CHISOS MOUNTAINS, TEXAS, June 9, 1939. All these specimens were collected by D. J. and J. N. Knull. With these I associate six specimens from the Leng Collection, no data. The types will be deposited in the United States National Museum. Paratypes are in the following collections: California Academy of Sciences (2); M. C. Z. (1); Knull (3); author's collection (3).

[1] Green, J. W., Ent. Am. vol. XX (new series), no. 4, pp. 159-217, 1941.

This species is near *Ch. profundus* Lec. and *Ch. ineptus* Horn and is probably placed in some collections as *profundus*. It can be easily separated from either of these species by the following key:

Species with apical third of elytra black; third antennal segment equal or nearly equal to fourth. (*profundus* group.)

A. Head black.....*ineptus* Horn

AA. Head pale.

B. Larger, 17 to 22 mm.; reddish orange, basal third or less of femora pale; long hairs at apex of antennal segments setaceous .....*profundus* Lec.

BB. Smaller, 13 to 17 mm.; yellowish, basal half or more of femora pale; long hairs at apex of antennal segments fine and silky.....*texanus*, n. sp.

Podabrus cascadensis Fender, new species

Black; head in front of eyes and sides of prothorax rufotestaceous. Head shining; feebly sparsely punctate in front, coarsely punctate behind; slightly wider than the thorax. Eyes small and inconspicuous. Antennae piceous with the exception of the basal segment which is paler; long, reaching to the apical third of the elytra in the male, slightly shorter in the female. Prothorax shining, finely sparsely punctate, more noticeably so just to the rear of the convexities; subrectangular, anterior angles rounded, sides arcuate to hind angles which are prominent; median line slightly impressed, not eroded. Elytra shallowly rugulose basally becoming more deeply so apically; pubescence pale cinereous. Front tibiae curved and apically dilated in male, simple in female. Posterior coxae of male with an apical process of yellowish hairs. Tarsal claws armed with a long acute tooth causing them to appear broadly cleft. Length, 11 to 12 mm.

Holotype, male, allotype, female, and one paratype, July 1, 1941, CLACKAMAS LAKE, OREGON; two paratypes, CLEAR LAKE, ORE., same date; one paratype, HOOD RIVER MEADOWS, ORE., same date. Holotype and allotype in California Academy of Sciences, paratypes in author's collection.

The ungual characters place this species in Mr. Fall's[2] first group. The small, not prominent eyes would place it with *P. latimanus* (Mots.) and *P. ambiguus* Fall. It can be separated from *latimanus* by the formation of the front tibiae, dilated inwardly into a thin plate in *latimanus*, apically dilated in *cascadensis*; from *ambiguus* by its color, ground color yellow in

[2] H. C. Fall, Ent. Am. Vol. VIII (new series), No. 2, pp. 65-103, 1928.

amgibuus, black in *cascadensis*. In reality *cascadensis* is much nearer *P. frater* Lec. and should follow that species in arrangement. In *frater* the eyes are large and prominent; the clypeus is pale basally and dark brunneous apically; the median line of the prothorax is deeply impressed and the elytral costae are prominent. In comparison, *cascadensis* has small, not prominent eyes, the clypeus pale, the median line of the prothorax shallowly impressed and the elytral costae feeble.

Podabrus brunneus Fender, new species

Brunneous; head, basal two segments of maxillary palpi, under side of basal two segments of antennae and basal half of femora rufo-brunneous; prothorax rufo-brunneous with a large hexagonal discal spot which is piceous. Head shining; finely, sparsely punctate in front of antennae; coarsely, closely punctate behind; as wide as thorax in the male, narrower than the thorax in the female. Antennae narrowly annulated, moderately stout; intermediate segments three times as long as wide; second segment four-fifths as long as third. Prothorax shining; finely, sparsely punctate, coarsely so anteriorly; front angles rounded, sides evenly arcuate to hind angles which are feebly prominent; median line shallow, not eroded, extending only for the length of the convexities. Elytra feebly rugose basally, becoming more evidently rugose apically; each with two evident costae. Anterior tibiae feebly bent and dilated apically. Hind coxae with an apical process of long hairs. Tarsal claws armed with a long acute tooth. Length: male, 15 mm.; female, 16 mm.

Holotype, male, and allotype, female, July 20, 1937, collected by D. J. and J. N. Knull in the HUACHUCA MOUNTAINS, ARIZONA. Holotype temporarily in the author's collection, allotype in the Knull Collection.

This fine species would run, in Fall's key, to *P. diadema* Fab. in the first group; claws with acute tooth causing them to appear broadly cleft. The protibiae of the males are too feebly bent and apically dilated to be placed in that division occupied by *rugulosus* Lec., *frater* Lec., etc. *Brunneus* can easily be separated from *diadema* by its large size and color; *diadema*, ground color black, length 9 to 10 mm.

Podabrus danielsi Fender, new species

Black, luster dull; head in front of eyes, basal three segments of antennae and sides of prothorax pale; apices of coxae, bases of trochanters, bases and apices of femora and tibiae narrowly pale. Head finely punctate in front; scabrose punctate behind. Anten-

nae stout, second segment one-third longer than wide, three-fourths as long as third; intermediate joints two and a half times as long as wide. Thorax two-thirds as long as wide; slightly narrower than head in male, as wide as head in female; front angles obliquely subtruncate; sides a little sinuate and convergent to hind angles which are prominent; surface finely, closely punctate, becoming nearly rugose punctate anteriorly; convexities less closely punctate; median impressed line deep and eroded. Elytra finely, closely rugose basally, becoming more noticeably so apically; pubescense pale cinereous. Claws of male cleft in front feet; anterior claws of middle and hind feet each with a short acute tooth; posterior claws of middle and hind feet cleft. Each of the claws of the female with a short acute tooth. Length, 6.5 to 7 mm.

Holotype, male, allotype, female, and three paratypes, July 18, 1941, BREITENBUSH LAKE, MT. HOOD NAT. FOREST, OREGON, collected by H. and F. Daniels for whom it is named. Holotype and allotype in California Academy of Sciences; one paratype in the Daniels Collection; two paratypes in the author's collection.

Danielsi is unique in the ungual characters of the males. It is similar in shape and coloration to *P. lateralis* Lec. and appears to be near this species. It can at once be separated from any other known species by the formation of the claws of the male. Mr. Fall, in his key, separated the species into seven major groups which are distinguished by the form of the tarsal claws. This species adds another group to those known to Mr. Fall.

Malthodes oregonus Fender, new species

Male. Head black, wider than thorax; labrum, mandibles and first two antennal segments pale testaceous, rest of antennae piceous, as long as the body; segments two and three of equal length. Thorax pale testaceous with a fuscous discal spot which is sometimes divided by the shallow median excavation; rather coarsely punctate; lateral margin sinuate, anterior angles deflexed. Elytra brunneo-piceous, paler at tips. Protibiae and apex of profemora pale; apex of femora and basal half of tibiae of middle and hind legs pale. Length, 3 to 3.5 mm.

Male genital characters as viewed ventrally: sixth ventral deeply emarginate, emargination not truncate at the bottom; seventh ventral deeply notched, forks diverging at basal half of furcation, becoming nearly parallel at tips (fig. 2); seventh ventral sinuate in profile, the upper surface leveling off to form a narrow triangle; last dorsal produced, arched over last ventral, broadened and truncate at tip, strongly carinate ventrally (fig. 1).

Female. Coloration as in male; thorax wider than head; antennae a little over one-half the length of the body. Length, 3 to 4 mm.

Holotype, male, allotype, female, and 69 paratypes, DAYTON, OREGON, May 16, 1940, D. M. and K. M. Fender; eleven other paratypes have been taken by us at McMINNVILLE, AMITY, BOYER and SAND LAKE, ORE., on dates ranging from April 7, to June 13. Holotype, allotype and two paratypes in the California Academy of Sciences. Paratypes as follows: U. S. N. M. (2); M. C. Z. (2); Green (4); Frost (2); Oregon State College (2); Knull (2); Malkin (2); the rest temporarily in the author's collection.

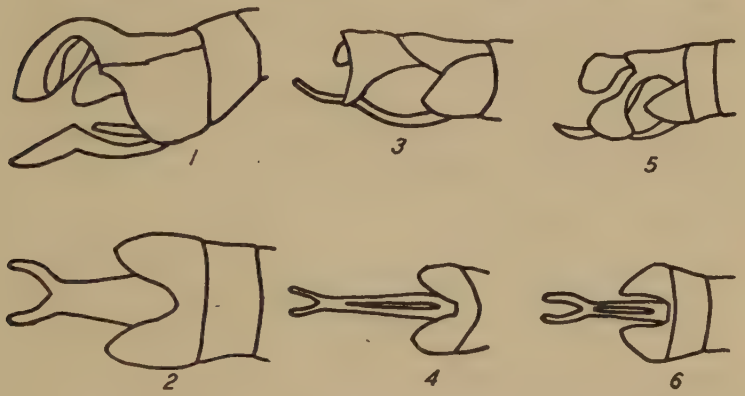


Fig. 1. Lateral view of terminal abdominal segments of *Malthodes oregonus*, n. sp. Fig. 2. Ventral view of terminal ventral abdominal segments of *M. oregonus*, n. sp. Figs. 3 and 4. Same of *Malthodes humidus*, n. sp. Figs. 5 and 6. Same of *Malthodes frosti*, n. sp.

This species is near *M. obductus* Fall but can be separated from that species by its larger size, sinuate thoracic margin and more divergent forks of the male seventh ventral.

Malthodes frosti Fender, new species

Male. Head black, antennae entirely piceous, as long as body; second and third antennal segments about the same length, fourth a little longer, intermediate segments four times as long as wide. Thorax brunneous to rufo-testaceous, transverse, narrower than head; lateral margins sinuate, quite widely margined. Elytra piceous, reaching to apical half of abdomen. Length, 3 to 3.5 mm.

Male genital characters as viewed ventrally: sixth ventral narrowly deeply emarginate, emargination truncate at bottom; seventh ventral elongate, deeply, broadly divided (fig. 6); seventh ventral strongly sinuate in profile; sides of last dorsal projecting downward, thence backward and expanded into large ovate

lateral processes enclosing the last ventral; terminus of last dorsal with a short, narrow median keel projecting downward (fig. 5).

Female. Coloration as in male; thorax wider than head, lateral margins divergent from basal angles for three-fourths of their length, then strongly convergent to the anterior angles. Antennae about one-half the length of the body. Length, 3.5 mm.

Holotype, male, allotype, female, and 21 paratypes, BEAR SPRINGS, WAPINITIA CUTOFF, OREGON, June 6, 1939; eight paratypes, ELK LAKE, ORE., July 9, 1939; two paratypes, MCMINNVILLE, ORE., May 23, 1938, and one paratype, MCMINNVILLE, ORE., July 30, 1939; all collected by D. M. and K. M. Fender. Holotype and allotype in the California Academy of Sciences. Paratypes as follows: U. S. N. M. (2); M. C. Z. (2); Green (2); Frost (2); Malkin (2); the rest in the author's collection.

Malthodes humidus Fender, new species

Color piceous, seventh ventral and sixth dorsal abdominal segments pale. Eyes large; antennae as long as body in male, shorter in female; second antennal joint slightly shorter than third, third slightly shorter than fourth, rest of segments nearly equal in length. Thorax narrower than head in male, wider than head in female; lateral margins convergent from the anterior angles, slightly sinuate in female; lateral margins convergent from the anterior angles, slightly sinuate, anterior angles deflexed. Length, 3 to 3.5 mm.

Male genital characters as follows: sixth ventral narrowly deeply emarginate, emargination faintly truncate at the bottom; seventh ventral slender, elongate, deeply, broadly divided at apex (fig. 4). In profile: seventh ventral sinuate; sides of sixth dorsal curved down and back into finger-like processes; terminus of sixth dorsal with a ventrally and posteriorly directed median lobe (fig. 3).

Holotype, male, allotype, female, and 14 paratypes, BOYER, OREGON, May 28, 1940. The following paratypes all were taken by Professor James A. Macnab at BOYER, ORE., (2) July 19, 1938, (1) July 23, 1934, (1) July 14, 1935, (1) June 28, 1936, and (1) July 23, 1937.

Variation: In some specimens there is a rufo-testaceous spot on each side of the thoracic disc; others have a noticeable tubercle on each side of the disc.

This species keys out to *M. tularensis* Fall but can be distinguished from that species by its piceous color; third anten-

nal segment noticeably longer than second and the produced downcurved side pieces of the sixth dorsal of the male. In *tularensis* the thorax is yellowish, the third antennal segment is scarcely longer than the second and the sixth dorsal is not produced.

Malthodes frosti and *M. humidus* both run to the last couplet in Mr. Fall's study[3]. In this subhead Mr. Fall had already placed *M. tularensis* and *M. visceratus* Fall. A revision of this couplet might be appropriate to include the new species mentioned above.

Emargination of the sixth ventral truncate at bottom.

A. Seventh ventral sinuate in profile, less widely and deeply forked.
  B. Last dorsal not produced.....*tularensis* Fall
  BB. Last dorsal produced, side pieces projecting downwards.
    C. Last dorsal side pieces projecting downwards, forming fingerlike processes.....*humidus*, n. p.
    CC. Last dorsal side pieces projecting downwards and expanding into large ovate lateral processes.....*frosti*, n. p.
AA. Seventh ventral apically bent, more widely and deeply forked .....*visceratus* Fall

---

INSECT ENEMIES OF THE SCARABAEID *POLYPHYLLA CRINITA* LEC.

(Coleoptera: Scarabaeidae)

BY ROBERT Y. PRATT
Coupeville, Washington

In western Washington the Scarabaeid June beetle, *Polyphylla crinita* Lec.[1], emerges from its pupal cell in the ground from about the first half of July into August. On Whidbey Island, State of Washington, the larvae of this beetle are present in great numbers in well-drained medium and lighter sandy soils; locally causing damage in commercial strawberry fields and Dutch iris bulb plantings.

While collecting specimens of *Polyphylla crinita* on Whidbey Island July 11, 1939, I saw one of these beetles flying pursued by two robber flies, *Stenopogon inquinatus* Loew. One of these

---

[3] H. C. Fall, Ann. Ent. Soc. Am. Vol. XII, No. 1, pp. 31-42, 1919.

[1] According to Essig, on Vancouver Island, British Columbia, and along the Pacific Coast the species of *Polyphylla* is *P. crinita* Lec. See reference, E. O. Essig, Insects of Western North America, The Macmillan Company, p. 443. 1934.

struck the beetle while flying, causing it to fall to the ground, with the robber fly still attached.

The robber fly had bitten into the *Polyphylla crinita* in the V at the base of the elytra just below the pronotum, and sucked the body juices of the beetle for a total period of sixty-five minutes. It shifted position from time to time, but kept its mouth parts in the beetle.

The beetle apparently died some time before the robber fly finished, for it gradually weakened and became entirely motionless some time before the fly flew away. The robber fly was noticeably distended at the time it finished.

Since then I have noticed a distended robber fly resting on a grass stem above a dead *Polyphylla crinita* adult, and am convinced that the robber fly *Stenopogon inquinatus* Loew. is a regular predator on this species.

I have received an authentic record of several of the Carabid beetle, *Carabus* (*Archicarabus*) *taedatus* Fab., attacking and eating a *Polyphylla crinita* larva; while all were confined. This occurred in 1939 on Whidbey Island. The specimens, over seven *Carabus taedatus* and two *Calosoma tepidum* Lec., were confined in a small glass jar of about one pint capacity, with a small amount of earth in the bottom. When the large *Polyphylla crinita* larva was placed in the jar it was attacked and eaten by three or more beetles, while others ran around the jar, taking no interest in the larva. There is a chance that the *Calosoma tepidum* also attacked the larva, but one or more of the *Carabus taedatus* definitely did. This is the *Carabus* (*Archicarabus*) *taedatus* Fab. described from the State of Washington as the subspecies *vancouvericus* Csiki or *bicolor* Walker[2], but this species is actually identical with the typical form *Carabus* (*Archicarabus*) *taedatus* Fab. and is not a subspecies.[3]

Although neither the robber fly *Stenopogon inquinatus* Loew. nor the beetle *Carabus taedatus* Fab. are present, on Whidbey Island at least, in sufficient numbers to control *Polyphylla crinita*, I have presented this information in the hope that it may add to the knowledge of these species and that it may encourage research on whatever natural enemies of *Polyphylla crinita* exist.

---

[2] Leng, Charles W., Catalogue of North American Coleoptera, p. 44, 1920. Also Ibidem, Second and Third Supplements, p. 10, section under *Carabus*, 1933.

[3] Pratt, Robert Y., *Carabus taedatus* Fabr. and its subspecies *vancouvericus* Csiki or *bicolor* Walker are identical. Pan-Pac. Ent., 16:95, April, 1940.

A NEW SPECIES OF METAPHYCUS PARASITIC ON PSYLLIDS[1]

BY HAROLD COMPERE[2]

University of California Citrus Experiment Station, Riverside, California

Metaphycus psyllidis, described below, is an encyrtid of more than ordinary interest because it parasitizes the nymphs of the tomato psyllid, *Paratrioza cockerelli* (Sulc.). All other species of *Metaphycus* have been reared from coccids, and for this reason it has been generally assumed that all the species of the genus were coccid-inhabiting parasites. The psyllid-inhabiting species was discovered by Kenneth Sloop, Deputy Agricultural Commissioner of Orange County, California, who noticed adult *Metaphycus* on the leaves and stems of plants of chili pepper (*Capsicum* sp.) in a field near Anaheim. Sloop's interest in this parasite was aroused because of its resemblance to *Metaphycus helvolus* (Comp.), a species recently introduced into Orange County for the control of the black scale, *Saissetia oleae* (Bern.).

Sloop submitted specimens of the parasite to the Citrus Experiment Station for identification, stating that the adult parasites were abundant on pepper plants and that he was unable to find coccids on these plants. On November 7, 1940, Sloop, S. E. Flanders, and the writer began a search for the insect in which the parasites were breeding. The pepper plants were found to be free from coccids but they were lightly infested with the psyllid *Paratrioza cockerelli*. A few of the psyllid nymphs were inhabited by the larvae and pupae of a parasite; others were empty shells containing parasite remains and having exit holes from which the parasites had emerged. The psyllid nymphs containing live pupae and larvae were isolated in a vial, and from these the parasites were reared. The parasites reared from the psyllids are indistinguishable from those captured as adults in the field.

In Timberlake's key to the species, *Metaphycus psyllidis* runs best to *M. flavus* (How.). It is not in entire agreement with

[1] Paper No. 480, University of California Citrus Experiment Station, Riverside, California.

[2] Associate in the Experiment Station.

Timberlake's redescription of *M. flavus*, however, and is clearly different from the Peruvian and Sicilian specimens which Timberlake identified as *M. flavus* when he redescribed the species.

Metaphycus psyllidis belongs to a group of species in which both the maxillary and the labial palpi are clearly three-segmented. This character readily separates it from the great majority of the described species. Only one species in which the maxillary and labial palpi are three-segmented was known to Mercet, namely, *M. insidiosus* (Mercet), and this he considered an anomalous species. Recently the writer described six African species having three-segmented maxillary and labial palpi. The psyllid-inhabiting species from California is different from any of these.

Metaphycus psyllidis Compere, new species

Female. General color lemon yellow; the mesoscutum, axillae, and scutellum slightly orange; body with black or brown markings as follows: center of pronotum and a faint dot on either corner of the collar, apex of postnotal wing process and parts of axillary sclerites, propodeum faintly on posterior aspect mesad of spiracles, fifth and sixth tergites faintly. Antennae yellowish white, with the basal half of club, first three or four funicle joints, base of pedicel, and a longitudinal blotch on outer aspect of scape, black or brown. Distal segments of the tarsi faintly dusky. Fore wings hyaline, uniformly ciliated; speculum interrupted below by two rows of hairs.

Frontovertex one and one-half times as long as wide. Ocelli in an equilateral triangle, or nearly so; posterior ocelli about once their own diameter from the orbits and occipital margin. Scape four and one-half times as long as wide, widest near the middle. Pedicel twice as long as wide and almost as long as the first three funical joints united. First funicle joint slightly wider than long; the second subequal to the first, those that follow plainly increasing in size; the sixth one and one-half times as wide as long. Club two and one-half times as long as wide, about one and one-third times as wide as the sixth funicle joint. Abdomen slightly shorter than the thorax. Ovipositor not exserted beyond apex of abdomen.

Length, 1.1 mm.

Male. Structurally the males closely resemble the females, but in color they have more extensive black or brown markings. Apparently the coloration is quite variable, for the tag-mounted male has the dorsum of the thorax extensively brown to blackish, in contrast to the two slide-mounted specimens, which have the dorsum of the thorax extensively orange yellow with limited, sharply contrasting black markings. In detail, the two slide-

mounted males are marked with black of varying intensities, as follows: occiput at sides of foramen; concealed part of pronotum and a dot on either corner of collar; anterior concealed margin of mesoscutum; scuto-axillary sutures and vertical margins of axillae and scutellum; apical half of tegulae, knob of second axillary sclerite, and apex of postnotal wing process; metanotum and propodeum mesad of spircales; dorsum of abdomen, except widely around margins. Tarsi of fore legs and apical tarsi of middle and hind legs slightly dusky. Color of antennae is similar to that of females.

In the tag-mounted specimen the head has collapsed, and in the balsam-mounted specimens the heads are turned so that the exact proportions of the head cannot be obtained. So far as can be seen, the proportions and positions of the ocelli seem to be similar to those of the female.

Length, 1.0 mm.

Described from five females and three males, holotype, allotype, and paratypes. Of these specimens, two females and one male are on points; one female is cleared, stained, and mounted in balsam on one slide; two females and two males are mounted in balsam under one cover slip, the female and male in the middle position being designated as the holotype and allotype, respectively. The tag-mounted paratypes and the stained balsam-mounted paratype were reared from psyllid nymphs isolated in a vial; the other specimens were collected on the leaves or stems of the infested plants in Orange County, California, November 7, 1940. The types of the new species are to be deposited in the United States National Museum, Washington, D. C.

PETUNIA, AN IMPORTANT WINTER HOST OF THE TOMATO MITE

The tomato mite, *Phyllocoptes destructor* Keifer, a very destructive pest of tomatoes, has been observed over-wintering in large numbers on petunia. Heavy infestations were observed in the vicinity of Woodland, California, on April 29, 1943. In some areas the population was so great that the base of the stems and lower leaves of the plants had a characteristic bronzy appearance resulting from the feeding of the mite. This observation indicates that petunia plantings may furnish an important source of mites for infesting tomatoes both in the beds and in the fields.—A. E. MICHELBACHER.

SOME NEW RECORDS OF OREGON CHRYSOMELIDAE

A recent examination of the collections of Oregon State College in Corvallis, Ore., and of the Forest Insect Station in Portland has revealed several species of *Chrysomelidae* not listed by Dr. Hatch in his catalogue[1] of beetles of this family from Oregon. A few species have also been added from author's own collection bringing the total of the new additions to ten, the list of which is as follows:

15287. *Saxinis saucia* Lec. June 15, 1915, "On flowers of Erigonum. (Port. Ins. Sta.)

15626. *Paria canella* Eab. Freewater October 8, 1914 (O.S.C.)

15626.d. *P. canella quadriguttata* Lec. Same data.

15633.a. *Timarcha cerdo* Stal. Dallas, June 7, 1932. "Feeding on beans." (O.S.C.)

15643. *Leptinotarsa lineolata* Stal. Ontario, July 20. (O.S.C.)

15703. *Gastroidea cyanea* Melsh. Talent, April 1, 1931. L. G. Gentner det. (O.S.C.)

15752.a. *Galerucella tuberculata punctipennis* (Mann.) Eugene, September 5 and 27, 1941; August 7, 1941; April 18, 1942; Spencer's Butte, October 12, 1941; Scott Lake, August 17, 1941. all Malkin.)

15753. *G. decora* (Say). Rickreall, September 5, 1905. (O.S.C.)

15754. *G. xanthomelea* (Schrnk). Grants Pass, May 26, 1935, Portland, September, 1934 (Port. Ins. Sta.); Eugene, August 22, 1941; June 10, 12, 1942, det. by B. E. White (Malkin).

—. *Monoxia guttulata* Lec. Klamath Falls, July 30, 1914.

21318. *Longitarsus waterhousei* Kutch. Albany, August 10, 1936, L. G. Gentner det.(O.S.C.)—BORYS MALKIN.

A NEW NAME FOR A NEW ZEALAND ARADID

Chinamyersia Usinger, n. n. for *Pseudaradus* Myers and China, 1928, Ann. Mag. Nat. Hist. (10) 1:388, not *Pseudaradus* Burmeister, 1834, Revue Entom. 2(1):19. This homonymy was called to the attention of Mr. W. E. China who suggested (*in litt.*) that I rename his genus. I take pleasure in naming it in honor of W. E. China and J. G. Myers, both of whom have contributed greatly to our knowledge of New Zealand Hemiptera.—R. L. USINGER.

[1] Hatch, M. H. "A preliminary catalogue of the Chrysomelidae of Oregon." Pan-Pac. Ent., Vol. VIII, No. 3, pp. 102-108, 1932.

OBSERVATIONS ON SOME COLEOPTERA FROM THE VICINITY OF MT. LASSEN, CALIFORNIA

BY E. G. LINSLEY AND C. D. MICHENER
University of California

The following observations and records were made in the Mt. Lassen area of northern California between May 19 and June 22, 1941.

CARABIDAE

Pterosticus ater Le Conte. On three different occasions adults of this species attacked and fed upon workers of *Zootermopsis nevadensis* (Hagen), in logs or stumps of western yellow pine (*Pinus ponderosa*), immediately after exposure during collecting.

HYDROPHILIDAE

Cymbiodyta imbellis Le Conte. The spring dispersal flight of this hydrophilid in the vicinity of Manzanita Lake, Lassen Volcanic National Park, took place on May 21, coinciding with flights of *Dendroctonus valens* Lec., *Hylastes nigrinus* Lec., and *Spondylis upiformis* Mann. The flight began at 6:50 p.m. and lasted until 7:10 p.m. The evening was warm and clear. During this period the beetles swarmed by the thousands around dark-colored automobiles in a manner suggestive of swarming bees. Light-colored automobiles were ignored, as were tents and white sheets which attracted *Dendroctonus* and *Hylastes* in large numbers. That the flight was widespread was indicated by the fact that it was simultaneously observed at a point about three-quarters of a mile away.

DYTISCIDAE

Agabus lutosus Le Conte. A few individuals of this species were noted in the swarms of hydrophilids recorded above. On the following night (May 22) there was a slightly larger flight but the *Agabus* were never comparable in numbers to the hydrophilid. By means of these flights, several temporary ponds formed by melting snow, became densely populated with water beetles. In these ponds the *Agabus* fed mostly on bibionid flies which fell upon the surface. When disturbed they grasped the

flies and carried them to the bottom of the pool. Several individuals were observed to feed simultaneously on a single fly.

STAPHYLINIDAE

Xenodusa montana Casey. This myrmicophile was found under bark of western yellow pine (*Pinus ponderosa*) in nests of the ant, *Lasius niger* subsp. *neoniger* Emery.

LYCIDAE

Plateros californicus Van Dyke. This species appears to be gregarious or semi-gregarious. Penultimate and ultimate stage larvae as well as pupae were found grouped together under bark of western yellow pine stumps near Viola, Shasta County, and Old Station, Shasta County, on various dates in June.

MELOIDAE

Meloe opacus Le Conte. The primary larva of this species may be briefly characterized as follows: Length 1¾ to 2 mm. Color pale brown; head broadly rounded, second segment of antennae about three times apical width, third segment arising from middle, ocelli visible dorsally, mesad of lateral margin of head, postero-lateral setae absent; pronotum about equally wide at base and apex, thoracic terga devoid of long setae; femora very robust; abdominal terga without long, dorsal setae, ninth tergum with a pair of median terminal setae as long as abdomen, lateral terminal setae as long as width of ninth tergum; sterna two to eight with a transverse row of six setae, the most lateral seta on each side longer, coarser, ventral extensions of terga with a long coarse seta on each side placed in line with the sternal setae.

Twenty-nine primary larvae were found on twenty-two specimens of *Andrena* representing three species. In all cases the larvae were attached to the hairs of the sides of the propodeum and in only one case were they found on a male bee. The latter was a male of *Andrena complexa* Viereck in an area where the females had not yet emerged. The larvae were taken as follows: one each on five females of *Andrena caeruleonitens* Ckll. collecting pollen from *Taraxacum vulgare* at Viola, Shasta County, California, on May 19, 1941, and one each on five females of the same species four miles west of Viola on May 20, 1941; one each on two females of *Andrena* sp. (near *ribifloris* V. & C.),

collecting pollen from *Ribes inerme* at Viola, May 19, 1941 (only 100 feet from the patch of *Taraxacum* visited by infested *Andrena caeruleonitens*) four (three on one bee) found on two females of *Andrena complexa* Vier. collecting pollen from *Ranunculus californicus*, four miles west of Viola, May 20, 1941; twelve (two on one bee, five on another) taken from eight females of *complexa*, two miles west of Viola, May 20, 1941; and one from a male of the same species at Big Spring, Shasta County, May 23, 1911. In each of the above localities the same flowers were visited by numerous other bees, flies, etc., but no other insects were found bearing primary larvae of *Meloe opacus*. Males of *Andrena* were also abundant, but except for the single specimen from Big Spring, no *Meloe* larvae were found on them.

Like many other species of *Meloe* the adults of *opacus* have an early season. Two stragglers were found on May 20, a female, two miles west of Viola, about 500 yards from the area where infested specimens of *Andrena complexa* were collecting pollen, and a male, four miles west of Viola at a point about 300 yards from flowers visited by infested bees. The female was gravid but apparently did not still have her full complement of eggs. The eggs which she contained were of large size and for this reason, in addition to those given above, we have associated these larvae (rather than either of the following small species) with *M. opacus*.

Meloe sp. a. Six primary larvae which appear to belong to the genus *Meloe* were taken on a female of *Andrena* sp. (near *monogonoparia* Vier.) nesting in a roadway in a Manzanita chute at Manzanita Lake, Lassen Volcanic National Park, May 25, 1941. The female was loaded with pollen from *Arctostaphylos* sp. and the meloid larvae were clustered on the propodeum. The larvae were about the same color as those of *opacus* but smaller (length 1 mm.) with the second antennal segment only about twice as long as its apical width, the third segment arising at one side of the apex of the second, and the pronotum widest at the apex. Also, there are two or more additional pairs of setae on the ventral extensions of the abdominal terga, the median apical setae of the ninth segment are perceptibly shorter than the abdomen, and the lateral terminal setae only two-thirds as long as the width of the ninth tergum.

Meloe sp. b. Primary larvae of a third species were swept in large numbers from flowers of *Ranunculus californicus* at

Shingletown, Shasta County, California, on June 2, 1941. These are similar in size (length 1 mm.) to sp. a, but are more slender, black instead of pale brown, and have the two median terminal abdominal setae distinctly shorter than the abdomen and the lateral terminal setae only about one-third as long as the width of the ninth tergum. Although the flowers were being visited by large numbers of bees (mostly *Andrena complexa* Viereck, but also *Panurginus*, *Halictus*, etc.) several hundred samples were examined without finding any that were bearing primary larvae.

On June 18, the locality was again visited. The larvae found were even more abundant but still none were taken from bees. In two small areas of ground about eight inches in diameter dense concentrations of larvae were found with from ten to twenty-five individuals lying among the stamens of each flower. Only open flowers were occupied although unopened buds were frequently higher on the plant. Occasional individuals were also found scattered through the field, always lying on the filament of the stamen facing the anther. The clustering of individuals in certain areas suggests that the females may have placed their eggs in the ground and the hatching larvae crawled up the plants. In the two areas mentioned the ground at the base of the plants was nearly saturated with moisture probably precluding its use as a nesting site for bees. Higher, more suitable ground, however, was within easy crawling distance for adult *Meloe*.

On June 21, 1941, a last visit was made to the locality. Primary larvae were still abundant but none were found on bees. When larvae were placed in contact with a specimen of *Andrena complexa* they made no attempt to take hold of the hair or climb on to the body. Apparently, if this species is actually a bee parasite, as its presence in flowers suggests, its host was not represented in the bees present through June 21st.

Pyrochroidae

Ischalia californica Van Dyke. This recently described species was taken under bark of Douglas fir (*Pseudotsuga taxifolia*) near Manzanita Lake, Lassen Volcanic National Park.

Buprestidae

Acmaeodera variegata Le Conte and *A. purshiae* Fisher. These two Great Basin species were taken at Hat Creek, Shasta County, California, on June 1, 1941. The former was collected on various

flowers, the latter beaten by A. Walz from *Purshia*. *A. variagata* is widely distributed in the intermountain region and apparently extends into California only as far as Trinity County in the northern part of the State.

PTINIDAE

Ptinus californicus Pic. An adult of this species was taken from a cell series of *Osmia lignaria* (Say) in an old abandoned burrow of a cerambycid in a log of western yellow pine (*Pinus ponderosa*) near Manzanita Lake, Lassen Volcanic National Park.

SCARABAEIDAE

Odonteus obesus Le Conte. Several hundred pupae and a few larvae of this species were excavated from the sandy soil of an old road bed in the midst of a manzanita chute on June 6. One adult female was found at this time. The pupal cells averaged 8x7x15 mm. and were found at a depth of from 3 to 6 inches below the surface.

Valgus californicus Horn. Adults of *V. californicus* were found in several localities in Shasta County in the nests of *Zootermopsis nevadensis* (Hagen).

ATLAS OF SCALE INSECTS

Atlas of the Scale Insects of North America. By G. F. Ferris. Stanford Univeristy Press. Photolith. 8½x11 inches. SI-1 to SIV-448, 1937-1942. Price, unbound, Ser. I, $6.75; II, $7.75; III, $6.75; IV, $5.75. Bound volumes $1.00 extra. Separate folders, $0.06.

This is, in effect a monograph of the Diaspidid scale insects of North and Central America and the West Indies. Considering the importance of this group of insects as pests of agricultural crops and considering the masterful and comprehensive treatment, it is the most important monograph on North American insects to appear in recent years.

Illustrations are given for 345 of the 350 described species of Diaspididae of North America with 28 genera, 2 new names for old genera, and 118 new species. It is estimated that this represents only one-third of the actual number of species occurring in the area. At the rate of one plate per day, a pace that no other entomological artist of my acquaintance could maintain, this represents an epic in original monographic work.

The format has been variously received by a critical public. Each species account is treated as a distinct four-page unit or separate publication, complete with title page, scientific name, synonyms, hosts and distribution, habit, recognition characters, and notes. All essential characters are illustrated according to a standard system, the separate figures being strictly comparable throughout. Absence of literature citations to genera, species and their synonyms is the only shortcoming. Repetition of title page, the numerous blank pages, and the arrangement into four series with separate dates of publication and, in some cases separate binding, are not serious objections and were inherent in the nobly conceived original plan. Specialists in the scale insects will carry out the original plan, binding the separate folios in systematic order, although no such final arrangement has been provided by the author. Librarians and book collectors will prefer the four series as bound and issued in 1937, 1938, 1941, and 1942 respectively. Bibliographers will complain loudly when they attempt to cite the number of pages and number of figures, only to find that these are not numbered consecutively. In his "epilogue" the author states that in future series, if any, the "loose leaf" form will be abandoned.

By far the most important single section is SIV-446, "Classification and keys to the groups." Of these 70 pages, the first 21 are devoted to general systematics of the Diaspididae and the remainder of the section contains complete keys to all forms.

The story of this Atlas is in a sense the story of systematic entomology. Conceived in pure scientific zeal, born in a strictly academic atmosphere completely free from administrative pressure, nurtured at great physical and financial sacrifice, this flower of systematic entomology bloomed in the sunshine of great popular acclaim. Then, despite the continued industry and enthusiasm of the originator, the flower faded for lack of support. It is all the more ironical when one considers that this is perhaps the most important single group of pests of agricultural crops. To quote the last lines of the epilogue, "If the world wants this Atlas of the Scale Insects of North America completed the world must find some way to pay for it."—R. L. USINGER.